WARREN GRANT MAGNUSON CLINICAL CENTER

NATIONAL INSTITUTES OF HEALTH

FOREWORD

The Warren Grant Magnuson Clinical Center is a complex organism suspended between frontline advances in medical science and the practicalities of patient care and research support. Our goals reflect the duality. We struggle to meet the sometimes conflicting needs of the National Institutes of Health, but even more important is our obligation to provide service to each individual volunteer-patient.

The institution has a distinguished record. It is recognized worldwide as something of a model facility for clinical research. Those of us who work here think we can improve on the past and are intent on doing so.

Some of the year's efforts and accomplishments are detailed in this informal report. Proud of their role, the people of the Clinical Center did the work described.

John L. Decker, M.D.
Director, Clinical Center

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The staff of the Building Services Office oversees and monitors all construction and renovation projects. On new projects, the office checks drawings for the projects to ensure compliance with fire safety codes and standards as set forth by the Joint Commission on the Accreditation of Hospitals (JCAH). The annual budget is $1.5 million. Approximately 700 new work requests are reviewed each year for funds approval as well as verification of what is needed for renovations.

Major renovation programs include the Medical Record Department, the Medical Information Systems, the NHLBI surgical suite, and the Department of Transfusion Medicine. This year, the NHLBI surgical program and the Department of Transfusion Medicine moved out of the round building (10A) to make room for construction of the new consolidated animal facility. The 10 West NICHD patient care unit opened in the spring and houses a 26-bed endocrinology unit.

Twice a year the Building Services Office coordinates emergency power tests for the hospital with the Division of Engineering Services. The Clinical Center is one of the few in the country that can switch the entire hospital to emergency power under controlled conditions in order to test the emergency generators.

The safety officer is responsible for the review, analysis, and follow-up on incident reports to ensure compliance with JCAH and the National Fire Protection Association regulations. An annual hazard surveillance of hospital areas is conducted and orientation in hazard surveillance is provided for all new employees.

The safety officer and the safety committee provide a safe environment for patients, visitors, and staff. This past year the committee continued to monitor such diverse Clinical Center activities as construction, incident reports and follow-up, waste disposal, training, and electrical and fire safety.

A "no-smoking" policy for all NIH buildings was instituted. An evaluation of the program three months after its initiation indicated that the policy had been accepted more readily than anticipated. The safety committee had a preoccupancy inspection and permit system created for newly renovated patient areas. This is the first time that patient care areas have been inspected for fire suppression and other safety concerns prior to occupancy. The program proved so successful that it may be instituted throughout NIH.

Finally, the Disaster Medical Assistance Team was activated by the undersecretary of DHHS to provide emergency medical care in austere field conditions for several thousand military troops. This is the first time such activation has been requested in the National Disaster Medical System. Team members were honored by the military and the Public Health Service for outstanding service.

PROTECTION AND SECURITY

Like a small town with heavy in and out traffic, the Clinical Center needs detailed and well-planned security services. During the past year, the Security Branch of the Division of Safety initiated a multifaceted crime prevention program in the Clinical Center. A special police unit dedicated exclusively to the Clinical Center has been expanded and is working to promote personal safety and property security in the hospital setting. Additionally, high profile patrol by uniformed officers, concentrated criminal investigations, and assignment of plain clothes officers for selected details have been effective.

A collaborative effort between the NIH Security Branch and its Clinical Center constituents has been the key to security success in the hospital. Crime prevention specialists and police section executive officers meet with Clinical Center staff members on a regular basis to identify and address common areas of concern. For example, all laboratories in the hospital building were visited by security personnel during the year to ascertain security vulnerabilities. As a result, most of the equipment in the labs has been secured by protective cabling or anchoring devices to prevent theft. Comprehensive written security surveys have been completed on many areas of the Clinical Center and efforts are continuing to provide this specialized service to each hospital unit in the near future.

Police officers, detectives, and crime prevention specialists have participated in a variety of training programs that reflect specific concerns associated with the hospital setting. This training has been put to good use by security personnel when responding to and handling emergency calls.

The Cardkey Access System has been expanded to include many areas of the Clinical Center, with other areas in the hospital to be brought on-line in the near future. Cardkey is a computerized door-locking system that makes it possible to monitor numerous remote access points. It enables NIH police to electronically lock and unlock doors, thereby reducing exposure time of unattended locations. At the same time, photo identification cards (PICs) with employees' photographs, employment location, and a coded access card help identify employees and provide access through controlled entry points. Twenty-eight hundred such identifiers have been issued to Clinical Center employees.

MATERIALS MANAGEMENT

The Materials Management Department serves as a support unit to virtually all other departments within the hospital. Its work includes purchasing and personal property management; central hospital supply; and storage and distribution.

The purchasing and personal property management section responds to all requests for supplies and equipment within the Clinical Center. This section's staff initiates the acquisition process and supports central hospital supply in maintaining an optimal inventory of expendable supplies. Further, purchasing and personal property management has instituted an automated method of managing the inventory of supplies and their sources. The new computerized system has streamlined the entire inventory process, enhancing the department's ability to support the needs of the Clinical Center.

The central hospital supply section collects, decontaminates, sterilizes, packages, and reissues medical supplies and devices used in direct patient care. This section's workload has increased over the past year partially due to the new precautionary guidelines instituted as a result of the spread of AIDS. Central hospital supply has met the increasing demand by instituting the par stock method of supply distribution to replace the total cart exchange method.

The storage and distribution section is responsible for receiving and issuing equipment, supplies, and forms throughout the Clinical Center. In addition, they store, pack and ship items for delivery on and off the NIH reservation. This past year a new and innovative system of space saver shelving has been installed. The movable and lockable units provide increased storage space and security.

In an attempt to provide optimal service and support to the Clinical Center, the Materials Management Department is challenged to use its resources to maximum effectiveness. This type of productivity is essential in order for the hospital to keep pace with the dynamic state of today's health care industry.

HOUSEKEEPING AND FABRIC CARE

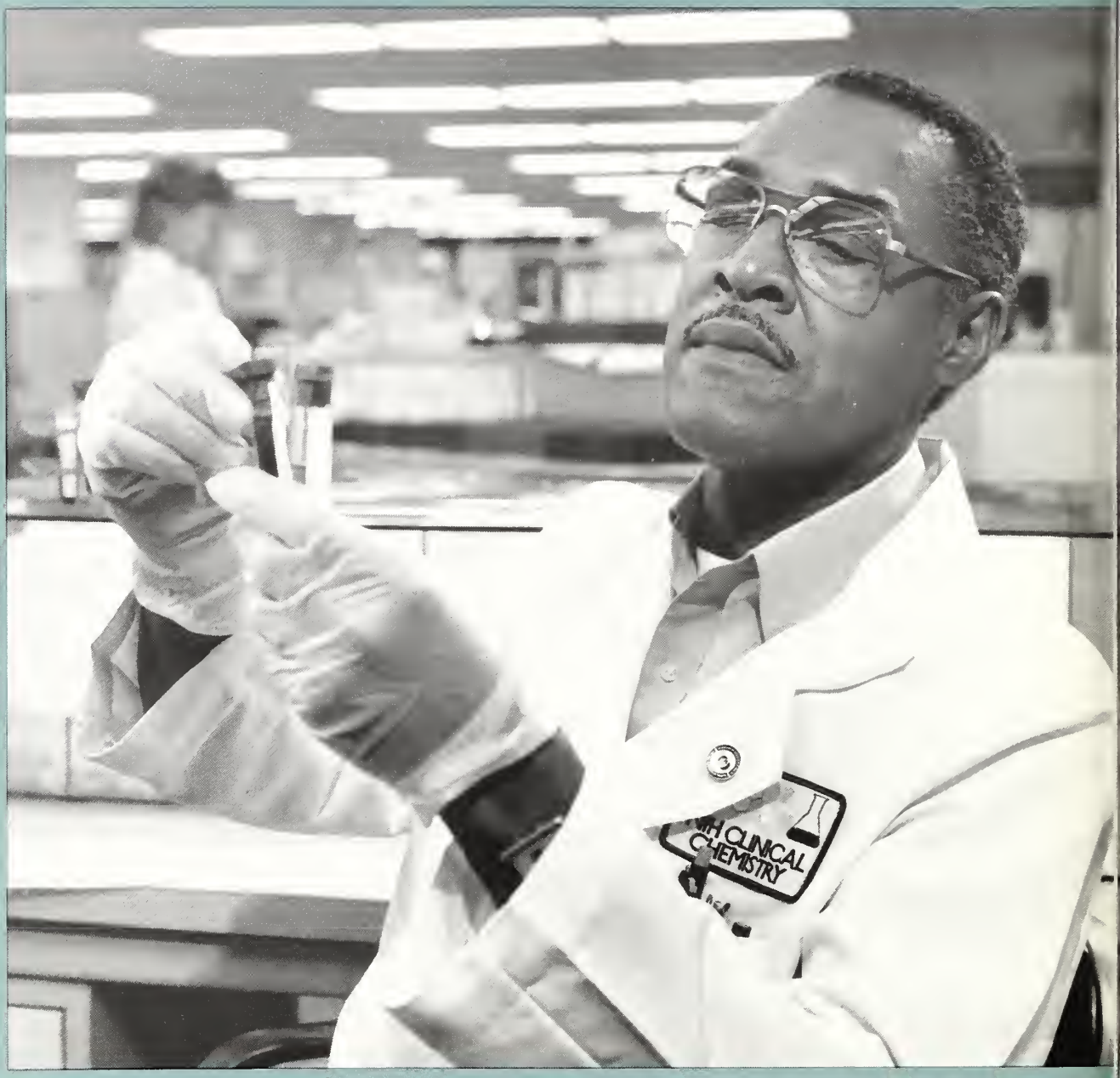
The most important goal of the Housekeeping and Fabric Care Department (HFCD) is to provide the safest possible sanitary environment for the Clinical Center. That's not an easy task with six miles of hallways and public space, more than 1,000 laboratories, and hundreds of offices and patient rooms.

The housekeeping sections collect and remove all general and pathological waste. During 1987, more than 1.4 million boxes of pathological waste were transported to the incinerator, and more than 4.4 million pounds of general waste were sent to the Montgomery County transfer point. This is a seven-day-a-week, 24-hour-a-day operation.

In addition to the cosmetic aspects, HFCD is responsible for flood control throughout NIH. During 1987, more than 100,000 gallons of water were cleaned up from various buildings as a result of floods.

The fabric care section provides clean linens for the hospital, clinics and laundry service for Poolesville Animal Farm, the Landow, the Westwood, and the Auburn buildings, and the Baltimore Research Center. During 1987, the fabric care section cleaned 1.4 million pounds, pressed more than 39,000 pieces, and processed 64,000 lab coats and other work clothing.

The department continues to support and encourage upward mobility and training for employees so they may work at their full potential.


CLINICAL
CHEMISTRY

MANAGEMENT SUPPORT SERVICES

The mission of the Office of Management Support Services is to formulate and execute the budget of the hospital and administer the personnel management programs for the staff.

The hospital's 1987 operating budget was $128,762,000. Through approved increases in nurses' salaries permitted under newly enacted Title 38 authorization, contracting for professional radiology services, and additional budgetary needs, the final expenditure was $134,581,000. The staff also prepared budgets for FY '88 and '89 at levels necessary to sustain current operations.

Personnel actions processed in FY '87 (including hiring, pay increases, promotions and other actions) increased by 20 percent over the last fiscal year. With an average complement of 2,166 employees, 256 people joined the Clinical Center staff and 264 left. In other personnel activities: special pay rates were approved by the Office of Personnel Management for critical care therapists, pharmacists, and clerical personnel; a pilot study in the Nutrition Department was initiated to test the applicability of the Career Opportunities Training Agreement (COTA) to aid in the recruitment of clerical staff; advice and assistance was provided to management and employees involved in contracting for the provision of professional radiology services; staff was trained and materials were distributed to employees concerning the Federal Employees Retirement System (FERS) and the Thrift Savings Plan, both new for government employees in FY '87.

A major undertaking of significant benefit to Clinical Center nurses was the approval and implementation of a new authority to use Title 38 of the Veterans Administration's legislation. The new authority allowed the Clinical Center to improve the pay for night duty, and to pay a premium for Saturday duty and for on-call service.

A major study entitled "Recruitment, Retention and Pay at the NIH Clinical Center" was completed. It resulted in the Clinical Center submitting a legislative proposal to obtain Title 38 (Veterans Administration) coverage for allied health specialists. Efforts are underway to streamline and consolidate the submission of special pay rate requests, as well as to brief other members of the DHHS, PHS, and NIH staff regarding Clinical Center allied health employment problems.

The Educational Services Office (ESO) organized the Clinical Center's two-phase orientation for more than 500 new employees. Phase one, held on the employee's first day, offers basic information about the Clinical Center operation through a slide presentation and talks with various department heads. Four weeks later employees attend the second half of orientation to ask questions and take a tour of the Clinical Center.

EQUAL EMPLOYMENT OPPORTUNITY

The Equal Employment Opportunity Office provides staff support and advise on all matters pertaining to equal opportunity and affirmative action. The office also provides information and assistance to employees who feel that they have been discriminated against based on race, religion, age, sex, national origin, or handicapping condition.

In addition, the office manages the Summer Research Fellowship Program for medical and dental students. This program provides research experiences for students who are interested in pursuing careers in biomedical research, academic medicine, or dentistry.

A total of 92 medical and dental students from 55 institutions across the country participated in the 1987 program. The program also sponsored a lecture series for students featuring NIH scientists.

CLINICAL CENTER COMMUNICATIONS

There have been numerous changes this year in the focus and responsibility of the Office of Clinical Center Communications (CCC).

The purchase of desk-top publishing equipment brought the office into the computer age and enables the CCC staff to create "camera-ready" copy for newsletters, patient education booklets, flyers, and other publishing needs.

Many employees of the Clinical Center missed their newsletter, *Closeup,* which was suspended for three months in the fall of 1987 in order to purchase the desk-top publishing equipment, learn its creative potential, and develop a totally new employee newsletter, *CC News.* The first issue was published in early December. *CC News* is really a monthly magazine, not a newsletter. The editors designed a new look, changed the focus, added more information, and created several new columns and regular feature stories.

The patient education unit of CCC has been active this year. *A Newcomer's Guide to Bethesda,* the redesigned patient information handbook, the reorganization of the Clinical Center's inhouse television network (CCTV channel 10), and the first annual patient education week are only a few of the many activities that reach out to patients and others to guide them to better health.

A new media policy concerning patient confidentiality and persons of interest to the media was written, approved by the Office of the Director and the Medical Board, and distributed throughout NIH.

The Clinical Center's lecture series, "Medicine for the Layman," was remarkably successful this year. Excellent speakers discussed such timely topics as AIDS, osteoporosis, and Alzheimer's disease to standing-room-only audiences in Masur Auditorium. WUSA Television 9 helped promote the series by airing interviews with the speakers and making special announcements prior to the lectures. Based on this annual series, distinctive and informative booklets and videotapes

are created and widely distributed to the public. The videotapes have been seen by more than ten million people.

An internship program was initiated by CCC with WUSA Television 9. Staff members spent as long as two weeks working at the TV 9 studio with the medical unit producing news stories on the latest developments in medicine and science. Several positive stories about the Clinical Center were aired due to the success of the internship program. A similar internship with WJLA Television 7 was initiated and several institute information officers were able to gain a unique educational experience working with medical reporters and producers.

The ever-changing art for sale in the CC galleries netted several thousand dollars for the patient emergency fund, and promoted a positive "look" and improved environment for staff members, patients, and visitors. Examples of the art program's success include the smoke-free posters and buttons. Rather than reinforce the negatives of eliminating smoking from campus buildings, the art program director and MAPB created the "Smoke-Free and Happy to Be" campaign. This image and message was so successful that Surgeon General Koop requested several posters for Public Health Service use, and was sporting a smoke-free button on his summer whites.

The special events section of CCC plans, coordinates, and directs programs for visitors to the Clinical Center. About 2,000 people visit each year.

It seemed particularly appropriate that during the NIH centennial year President Ronald Reagan visited the Clinical Center and met several pediatric oncology patients.

KEEPING PATIENTS HAPPY

PATIENT ACTIVITIES

The Patient Activities Department provides therapeutic recreation and library services to patients and their families. In doing so, the department promotes the importance of recreation in the maintenance of a healthy lifestyle and in the improvement of the health of hospitalized persons. All services are designed to promote involvement, free choice, and enjoyment; are consistent with the patient's assessed needs and limitations; and support Clinical Center research. Activities include sightseeing in Washington, D.C.; basketball, volleyball and weight lifiting; and seeing movies.

The department also developed new services for patients and their family members. A personal computer was installed in the patient library, and a "recreation hotline" was established with a recorded message of daily and weekly activities available to patients. The department also published *Hospital Jobs: Things People Do in the Hospital,* which is an activity booklet for children, and *A Newcomer's Guide to Bethesda,* designed to help patients know what is available to them in the immediate Bethesda area.

During the past year, the department continued to buttress the clinical bases of its services to patients by strengthening its orientation toward therapeutic recreation principles. It has made major changes in patient assessments and treatment planning, documentation, and clinical reviews. Reporting methods were revised in order to more accurately represent departmental functions.

PATIENT REPRESENTATIVE

A full-time patient representative is committed to protecting the interests and representing the perceptions of patients and families at the Clinical Center. In FY '87, with the assistance of volunteers, about 1,500 patient family contacts were documented, more than two-thirds of which were new to the hospital. In addition to providing a contact person and prompt response for patients and families, the patient representative periodically reviews patient orientation materials, suggests changes, participates in the orientation of employees, and serves on several committees.

The patient representative investigates complaints or grievances by patients, their families, staff, and volunteers to determine the nature of the problem and which staff, service or department can best address the issue. While investigation and problem-solving are significant aspects of the patient representative function, the greater goal is to prevent problems by contributing to the education of patients and the sensitivity of the staff.

NORMAL VOLUNTEER PROGRAM

Normal volunteers, healthy individuals who are studied to provide scientists with data about normal body functions, have been an integral part of research activities at the Clinical Center for many years. Since 1954, young adults—generally college students from all over the country—have been admitted as inpatients for up to three or four months to serve as normal control subjects for clinical trials being conducted by researchers from the institutes. The students also have the opportunity to work in a laboratory giving them "hands on" experience in a modern biomedical research facility and providing an adjunct to their academic studies.

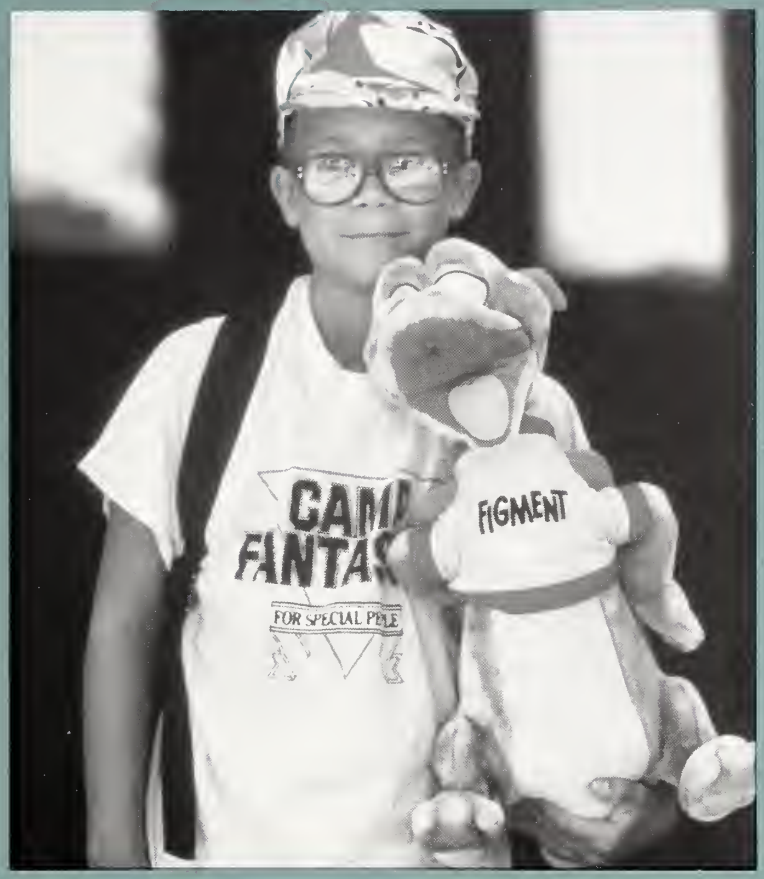
Currently, more normal volunteers are coming from the local community. Approximately 1,500 persons from the Washington metropolitan area make themselves available to researchers at the Clinical Center for outpatient studies.

CHILDREN'S SCHOOL

Next to the 10th floor solarium door is a quilted wall hanging of a traditional schoolhouse. Appropriately, the door leads to the one-room NIH schoolhouse. Three hundred and seventy-five school-age patients from grades kindergarten through twelve were taught there in 1987. The staff of six teachers from the Montgomery County school system attempts to meet the educational needs of inpatients and outpatients.

The NIH Children's School was established in 1953. Its goal is to provide students the opportunity to study and keep up with their classes so that the transition to their hometown school is as smooth as possible.

There is an additional classroom on 3 East that has been involved in an NIMH research study of boys with attention deficit hyperactivity disorder. In 1987, students who were HIV positive joined classes at the NIH school for the first time.



SPIRITUAL MINISTRY

The Department of Spiritual Ministry provides a pastoral response to the spiritual and religious needs of patients, families, and significant others at the Clinical Center. Jewish, Roman Catholic and Protestant chaplains provide a full-time ministry of visitation, worship, sacrament, interdisciplinary care, and administrative support.

Father Eugene Linehan, S.J., coordinates Roman Catholic ministry that includes a daily Mass in the 14th floor chapel, celebrated by one of the priests on staff.

Rabbi Joseph Levine provides visitation and a variety of supportive services to Jewish patients. He also conducts a service each Friday in the 14th floor chapel. Rabbi Levine created *Gates of Healing*, a booklet to orient patients to the Clinical Center and provide inspirational and introspective material.

For many years, the Greek Orthodox Church of St. George has provided special religious and spiritual care for Greek patients. Father George visits and provides sacramental services to Greek Orthodox patients on a regular basis.

Protestant chaplains include Chaplain LeRoy Kerney, chief of the department, and Chaplains Johnston and Bentzinger. A Protestant worship service is held each Sunday morning in the 14th floor chapel. A mid-week devotional service also is held in the 14th floor chapel.

Chaplains provide visitation and sacramental services, and also serve on various committees and conferences. A program of clinical pastoral education for seminarians and community pastors has been developed. Students attend full time for a summer session. Others may enroll for a 2-day-a-week extended quarter during other times of the year. Chaplain Rebecca Bentzinger serves as supervisor for this program.

The centerpiece of the department's work continues to be the direct pastoral care of patients and their families.

Individual and group counseling services are available to help patients adjust to illness and hospitalization. Social workers help patients and families use community resources they know little about and commonly never expected to need. They interpret rules, regulations, forms, and eligibility criteria associated with health, financial, and social support services and ease the process of seeking, identifying, and accepting help from agencies in their home communities. With knowledge about the mission and functions of public and voluntary agencies, social workers can help families find those resources most suited to their needs. They work with patients and families in planning for discharge from the hospital to assure the continuity of their care.

In addition to discharge planning, social workers provide counseling services for crises, emotional problems, rehabilitation, and concerns related to dying and death. Meeting psychosocial needs expressed by patients and families within these areas, the staff counseled about 5,600 hospital and clinic patients in 1987. About 22,000 social work contacts were made with individuals and family members. More than 500 group meetings were held with an attendance of three to twelve patients each session. The meetings provided useful health care information, support for problem-solving, and orientation to the hospital and the community. Social workers routinely participated in rounds and meetings with other patient care staff.

Staffed by a full-time director, the volunteer program has become an integral part of the department. This year more than 225 Red Cross volunteers, general Clinical Center and special project volunteers, and 23 community-based special interest groups contributed about 2,700 hours each month to meet the needs of patients, family members, and paid staff.

Volunteers offer personal and support services to assist patients' transition from the community to the hospital environment. Service laboratories and administrative offices give volunteers an opportunity to share knowledge, develop skills, and discover new interests. The preparation and distribution of newsletters, promotional brochures, and patient education literature, as well as support duties in research activities, special events, and conferences are assignments that reward volunteer students, retirees, and other talented citizens. In support service areas, volunteers give general information, provide escort services, deliver mail and flowers, answer telephones, assist patients with menu selection, provide refreshments to patients and families in waiting areas, and contribute to crafts programs. This hospitality brings comfort and assurance to patients and their families.

KEEPING PATIENTS ORGANIZED

INFORMATION SYSTEMS

The Information Systems Department (ISD) was created in 1983 to consolidate such Clinical Center computer activities as planning, development, operations, and maintenance.

The department currently operates a computer center providing 'round-the-clock service to patient units, clinical pathology, pharmacy, radiology, admissions, and other departments engaged in administrative, diagnostic, and therapeutic activities.

In addition, ISD provides advice and support to Clinical Center departments that have or are contemplating acquiring micro- or mini-computers, or other computer hardware or software.

ISD manages and operates the Clinical Center Medical Information System (CCMIS), a large "real-time" computerized system that provides access to patient records to retrieve and add data. Medical orders are entered directly by physicians or nursing personnel using video terminals that connect to a central computer. Patient information is displayed on video screens and printed for incorporation into the patient record.

CCMIS is used by more than 2,000 physicians, nurses, and others at work in the Clinical Center. Each year, ISD trains approximately 250 physicians, 300 nurses, and 550 other staff members to use the system. There are more than 6,000 patient biographical records on file and complete clinical records are retained on the system for all current patients. Each day 13,000 new entries are made to patient records. In 1987, more than one million records were added to the system and a like number of vital signs entries; more than ten million pages of patient medical records were printed. The total patient information on disk files, available for instant retrieval, exceeds one billion characters. In addition, patient data on 200,000 former Clinical Center patients is maintained at the Division of Computer Research and Technology for retrospective research studies.

To provide support to the wide range of CCMIS users, ISD maintains 21,000 screen display formats and hundreds of printout formats. Each year, ISD creates 5,000 new or revised screen formats and handles 40,000 telephone calls related to CCMIS support and enhancement.

In FY '87 a variety of enhancements were made to data processing systems at the Clinical Center. Methods were developed to improve the extraction of selected elements of research data from CCMIS and to transfer this information to authorized personal computers operated by individual researchers. Attention was focused on patient confidentiality; only specifically authorized users have access to the data.

Progress was made in developing multi-function terminals that can emulate and therefore replace a variety of special purpose terminals. Two powerful new computers were installed in the ISD computer center with much larger disk storage capacity. This new hardware and some new software packages will enable ISD to provide better service to many departments and enhance patient care and research capabilities.

MEDICAL RECORD

The Medical Record Department maintains and makes available the record of each Clinical Center patient. Some of the individual binders contain only one or two sheets of paper; others are multi-volume tomes equalling the Encyclopedia Britannica in size. The appropriate record must be available for every clinic visit and every hospital admission. They also are used in medical and scientific research and for medicolegal or administrative activity. The medical record serves as a dynamic mode of communication describing the care of the patient as well as allowing a continuous accounting of patient management, and access to research data.

In order to assure the effectiveness of the medical record, the department must concern itself with systems for the maintenance, analysis, storage, and retrieval of medical records while preserving the integrity, privacy, and legality of the information they contain.

The scope of this effort can be appreciated by glancing at some figures for 1987. Staff in the files section pulled more than 83,000 medical records for patient care; 17,000 for research; and filed more than half-a-million individual medical reports into the records. The medicolegal section processed more than 9,000 requests for disclosure, and dispatched more than 150,000 pages of medical information. Staff in the record processing section performed approximately 30,000 medical record analyses, and processed some 19,000 dictated medical reports. The coding and retrieval section coded more than 1,000 research retrievals involving 400,000 automated abstracts from patients' files.

HOSPITAL ADMINISTRATIVE OFFICERS

The Hospital Administrative Officers (HAOs) are members of the management staff of the executive office. Their mission is to provide overall, on-site, administrative management of the patient care units and special procedure areas within the Clinical Center. Their activities have focused on improving the general efficiency of the patient care units. This involves formulating, implementing, and executing budgets for equipment and supplies, and serving as administrative representatives for renovations and improvements in patient care areas. In addition, the HAOs frequently serve on interdepartmental committees.

The HAOs are the principal representatives for space utilization and design of patient care units. In 1987, they participated in the design for the renovation of the neurology units. In July, the major renovation of 10 West was completed and the unit was occupied. Other renovation and upgrade projects that were planned or completed included 11 East, the day hospital on 13 East, and the 13th floor conference room.

In 1987, the HAOs continued to identify and analyze unit supply system problems. Based on their study results, changes have been implemented to make the system more effective. The HAOs managed the market survey for the planned acquisition of replacement monitoring equipment for the hospital, and produced a service resource manual for patient care areas.

The role of the Outpatient Department becomes crucial as clinic days can resemble a version of Metro Center at rush hour. The Outpatient Department can be thought of as keeping the subway trains running on time. In FY '87 145,000 outpatients were seen.

In addition to the 45 clinics it manages, the Outpatient Department is responsible for admissions, EKG, echo and stress laboratories, a travel and voucher office, local transportation, and the messenger and escort service. Each section provides special services to Clinical Center patients to ensure smooth and efficient progress through inpatient and outpatient areas.

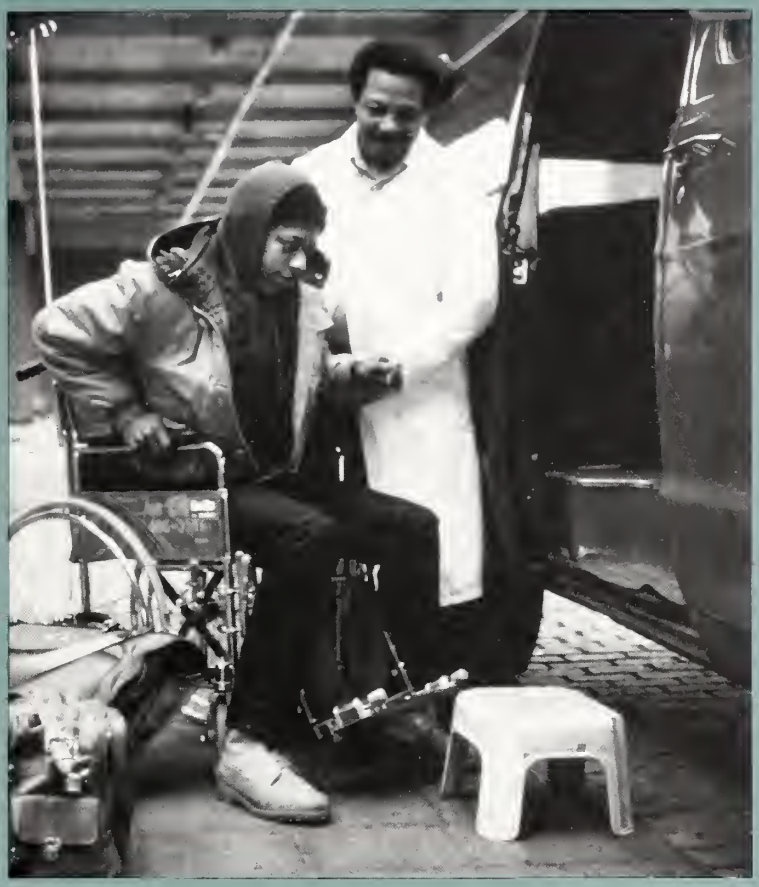
The National Heart, Lung, and Blood Institute (NHLBI) opened its clinic on the 7th floor in the second quarter of FY '87. Even though NHLBI is the primary user, the clinic will be shared with the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS).

The National Institute of Child Health and Human Development (NICHD) clinics were moved to the 9th floor in order to convert the entire 11th floor clinic into a specialized unit concentrating on therapeutic trials of AIDS.

The department has worked with Clinical Center Communications to develop new signage, a pamphlet entitled *Welcome to the Clinical Center,* master directories, and "You Are Here" locator signs.

The messenger and escort service has made a positive contribution to the hospital. The escorts transport patients from place to place.

The department implemented a quality assurance program and several training programs for the staff. These programs will have a positive influence on staff members and on their efficiency in their day-to-day activities.



KEEPING PATIENTS FED AND MEDICATED

NUTRITION

In addition to providing quality nutritional care and food service to patients, the Nutrition Department supports institute protocols designed with a nutrition component and conducts research in clinical nutrition and food service management.

A two-week menu cycle offers 12 modifications to meet the needs of patients on a variety of diet prescriptions. The food choices offered on these menus reflect the current dietary guidelines for healthy eating. *The Clinical Center Diet Manual,* written by Nutrition Department dietitians in 1987, provides guidelines for 49 types of therapeutic diet plans used at the Clinical Center.

All meals, snacks, and supplements for patients are prepared in a main kitchen. Staffed with registered dietitians, supervisors, cooks, bakers, and food service workers, the main kitchen operates 14 hours a day, seven days a week. The kitchen serves more than 30,000 meals a month at patients' bedsides. Extended services meet the needs of patients whose meals must be served early or late because of tests and procedures they undergo. The department also provides an average of 110 meals to outpatients each month.

Special kitchens produce meals for metabolic balance studies (a method of investigating the metabolism of chemical elements or food constituents in a patient by determining the loss or retention of these substances in the body) and meals of low bacterial count for those patients who are unable to ward off infection.

The clinical nutrition service includes a staff of registered dietitians who work as members of the medical team, assess patients' needs for various levels of nutrition intervention, and provide care based on the need identified. A patient with cancer, for example, may follow a different diet plan than a patient with heart disease.

Inpatients at the Clinical Center receive most of their medications by a "unit dose" distribution system. A 24-hour supply of unit dose medicines is placed in a drawer labeled with the patient's name and delivered to the nursing unit. This system helps assure that each patient receives the correct dose of the correct drug at the correct time. Each dose is individually packaged, labeled and protected from contamination up to the time it is administered. The unit dose distribution system is the safest and most reliable way to give medications to inpatients. Approximately one million doses of medicine are dispensed by the inpatient pharmacy each year.

Pharmacists working in the intravenous (IV) admixture unit prepare all of the medications that will be given directly into a vein. This is usually a matter of adding concentrated drugs to sterile salt or sugar water. Once the drug is dissolved, the mixture is ready for intravenous administration. Specially trained pharmacy personnel make these intravenous solutions under rigorous standards of sterility and quality control. The pharmacists ensure that all medications mixed in intravenous solutions do not interact unfavorably. The solutions are made in laminar flow hoods that filter out dust and bacteria in the air so the solution will not be contaminated with potentially dangerous airborne material. The inpatient pharmacy mixes an average of 750 IV admixtures each day; however, there are peak days when the workload is in excess of 1,000.

The outpatient pharmacy fills prescriptions for outpatients and those who are discharged. The pharmacists also counsel patients about their medicines. It is important that medicine is taken properly because the success of the treatment protocol depends on strict adherence to the directions of the prescribing doctor. The outpatient pharmacy keeps extensive patient records so that every dose of investigational drug is accounted for and the integrity of customized drug therapy regimens is maintained. The outpatient pharmacy fills approximately 400 prescriptions each day. Medications are mailed to patients who are in long-term studies and do not require frequent follow-up visits.

The department registers and controls all investigational drugs used for Clinical Center patients and provides a variety of services to assist doctors in their clinical studies. Tablets, capsules, or injections are prepared as required by the protocol. More than two million investigational drug units are formulated and packaged each year. Pharmaceutical chemists test the potency and stability of the drugs produced by the Pharmacy Department. Detailed records are kept on the amount of drug dispensed to each patient and when the drug was given.

Clinical pharmacists are assigned to such patient care areas as cardiology, mental health, oncology, neurology, intensive care, and internal medicine. These pharmacists do not provide a product; rather, because of their drug therapy expertise, they provide a consultative service.

In 1987, the Pharmacy Department completed its move into renovated quarters. Corrections in the construction design were resolved while the pharmacy was in operation. The outpatient pharmacy was designed to improve efficiency and enhance patient counseling. An inpatient oncology unit was built, staffed and began operations on the 13th floor of the Clinical Center. It serves the needs of the NCI inpatient units on the 12th and 13th floors. Chemotherapy and other intrave-

nous medications are prepared on site, allowing for better communication between physician, nurse, and pharmacist. A computerized drug inventory control system was implemented thus allowing for more efficiency in obtaining and stocking six million dollars worth of medications purchased in FY '87. In 1988, the pharmacy will test the use of bar coding in managing stock and issuing medications within the pharmacy.

In FY '88, the support of AIDS treatment and research will probably be expanded. Improvements in the medication delivery system will be implemented. The efforts in computerization also will continue with several projects under investigation, such as a drug-drug interaction surveillance system and a food-drug interaction surveillance system. The Pharmacy Department strives to provide the highest level of pharmaceutical services possible and continues to improve them as technology advances.

MEDICAL STAFF SUPPORT

CLINICAL ELECTIVES

The NIH conducts a program of elective courses open to third- and fourth-year students from the nation's medical and dental schools. In-depth exposure to any of 16 clinical subspecialties is available through the collaboration of these institutes. Students work closely with staff during their rotations. Tutorials in biological sciences may be arranged for them in a number of research laboratories. In FY '87, a total of 184 students from 74 U.S. medical and dental schools (and two Canadian schools) received training in such diverse fields as surgical oncology, psychiatry, geriatrics, and computers in clinical medicine.

MEDICAL STAFF AFFAIRS

This office provides support to the Clinical Center Director and the Medical Board on the organization and function of the hospital's medical staff and on medical-administrative policies governing the provision and assurance of quality of patient care. It also assists the Clinical Center Director, the Institute Clinical Research Subpanels, and the NIH Human Research Review Panel to formulate and implement policies on the conduct, review, and approval of clinical research in the hospital.

In FY '87, approximately 900 medical staff members were recredentialed and reappointed; each had specific clinical privileges delineated. New policies set forth in the hospital's *Medical Administrative Manual* addressed, for example, handling shortages of beds in the ICU, the use of new forms in the clinical research review and approval process, the administration of medications, the release of information to the media, the consent process in research involving impaired human subjects, the use of investigational drugs that are brought to the hospital by patients for therapeutic use, hospital risk management, and peer review.

Approximately 200 new clinical research projects were approved in 1987 bringing the total of active studies to well over 900. Approximately 100 amendments to previously approved protocols were processed during the year.

BIOETHICS

When ethical problems arise in patient care or research for physicians, nurses, patients, or their families, consultation can be sought from the Clinical Center bioethicist.

The Bioethics Program provides three services to help safeguard the highest ethical standards in clinical research and patient care. Assistance is given to the director of the Clinical Center in second-level review of research to determine the suitability of experimentation with human subjects. Secondly, a 15-member liaison group provides consultation on ethical problems in such difficult areas as caring for terminally ill patients and obtaining informed consent from patients. Thirdly, educational programs or seminars on bioethics are arranged.

In 1987, the Bioethics Program continued to expand its consultation guidelines for HIV testing in the Clinical Center and the use of the "durable power of attorney" for those unable to understand or agree to procedures for themselves.

MEDICAL STAFF DEPARTMENTS

HOSPITAL EPIDEMIOLOGY

The Hospital Epidemiology Service (HES) monitors the occurrence of nosocomial (hospital acquired) infections, investigates clusters or outbreaks of such infections, and devises policies and procedures to prevent their occurrence. The service also educates staff and patients regarding prevention of nosocomial infections, and conducts research into the epidemiology, pathogenesis and prevention of infections. During 1987, the service kept busy responding to patient and staff concerns about patients infected with human immunodeficiency virus (HIV), the cause of Acquired Immunodeficiency Syndrome (AIDS).

The HES has continued to focus on HIV, disseminating current epidemiologic information (data on incidence and distribution), and emphasizing the similarities of the epidemiology of HIV to that of hepatitis B. In order to minimize the potential for the nosocomial transmission of HIV and hepatitis B, HES has continued to revise isolation precautions specifically designed to eliminate exposure of health care workers to blood or body fluids of these patients. HES has conducted numerous educational sessions, both formally and informally, for virtually every department. All employees, from the medical staff to the housekeeping personnel, were made aware of the presence of HIV-infected patients in the Clinical Center, given accurate, up-to-date information about the virus and its epidemiology as it became available, and given the opportunity to voice their concerns and questions.

The service conducted numerous educational programs for professionals and non-professionals in the community to minimize confusion about HIV. Many medical, nursing and technical associations, as well as lay organizations, requested the service to provide information, answer questions, and allay unjustified fears of this disease.

To evaluate the precise risk associated with exposure of employees to HIV-infected patients, HES is conducting a prospective study in which antibody levels to the organism are sought and measured in annual or more frequent blood samples. The risk has been found to be so small that it is difficult to measure.

The hepatitis B immunization program, in collaboration with the Department of Transfusion Medicine and Occupational Medical Service, is continuing.

SURGICAL SERVICES

This has been a dynamic and eventful year for the Surgical Services Department. All of the institutes' surgical programs have been incorporated into the main surgical suite. The 10A cardiac operating rooms were moved into this suite with minimal disruption to the cardiac surgical program. The program will move once more upon completion of the new surgical wing that will also accommodate the neurosurgical program. The change will greatly facilitate maximum utilization of human and material resources. Space management and planning were critical to the success of this effort and are continual challenges as new surgical protocols create technological change.

Among a number of new protocols is a collaborative effort involving patients with Parkinson's disease who receive adrenal medullary autografts. This procedure is performed in stages and involves neurosurgical and intra-abdominal surgical intervention.

Surgical services programs were increased in FY '87 with the addition of a full-time ear, nose and throat surgeon.

The challenges associated with all of these changes fostered team spirit that is visible in retention and recruitment efforts. The environment encourages the development of surgical expertise and the safe management of surgical patients.

ANESTHESIA

The Anesthesia Section is responsible for the anesthesia support and clinical care of patients. The section provides medical consultation for pain therapy, critical care, and resuscitation. Other activities include professional support for the institutes in their investigational programs; participation in teaching postgraduate physicians, residents, medical students, and other health professionals in the principals and clinical practice of anesthesia and advanced cardiac life support; and initiating primary clinical investigation.

In FY '87, anesthesia and support services were provided in 1,955 instances, 144 of which were emergencies and 161 of which were open heart procedures. The recovery room cared for 1,248 patients, 267 of whom were outpatients.

An ongoing advanced cardiac life support course, sanctioned by the American Heart Association, is given. Three physician and five nurse faculty members actively participate in the courses. During the year, four courses were presented and 54 providers were certified. In addition, courses in basic cardiac life support were conducted in conjunction with Occupational Medical Service, NIH.

CRITICAL CARE MEDICINE

The Critical Care Medicine Department (CCMD) directs the medical intensive care unit, provides consultative services for seriously ill patients, supervises respiratory therapy and hemodynamic monitoring for all patients, provides an educational program in critical care medicine for technical staff and fellows training in critical care, and conducts research on basic and clinical problems relevant to seriously ill patients.

Clinical Center patients often have serious, life-threatening problems that require the special skills of critical care physicians, as well as attention from specially trained nurses and technical personnel. During FY '87, CCMD admitted 228 seriously ill patients for 1,550 days of intensive care. An additional 198 patients were admitted for short-term stays in order to perform such clinically-indicated and protocol-required invasive procedures as bronchoscopy, heart biopsy, right heart catheterization to evaluate volume status, or central line placements for intravenous infusions. The majority of the CCMD patients were admitted by the National Cancer Institute (45 percent) and the National Institute of Allergy and Infectious Diseases (37 percent).

Patient care activity, the primary responsibility and focus of CCMD, has become increasingly busy over the last five years. The number of patient admissions has increased by 178 percent compared to FY '84. Respiratory therapy and hemodynamic monitoring provided service to 110 percent more patients in FY '85 than in FY '84. Several institutes admitted more patients with more severe illnesses during FY '87 compared to earlier years. If a successful outcome is to be attained, many therapeutic regimens in NCI, NIAID, NHLBI, and other institutes require the ability to support patients through critical illnesses commonly induced by chemotherapy, radiation, or surgery.

Critical care medicine has been recognized as an official subspecialty by multiple specialties including internal medicine, surgery, anesthesiology, pediatrics, and others. CCMD has trained four fellows annually since 1982 and fellowship graduates have been recruited by outside institutions. They have left the Clinical Center for leadership positions or further training elsewhere.

The department's research, much of which has been collaborative with the institutes, has focused on septic shock, adult respiratory distress syndrome, the effects of endotoxin, AIDS, respiratory mucous production, and cardiomyopathy. The sophisticated facilities of the department have made possible important studies never before carried out on patients or healthy volunteers.

The department has simultaneously provided quality service and national leadership in the field.

REHABILITATION MEDICINE

The Department of Rehabilitation Medicine provides treatment to all hospital patients in need of physical and occupational therapy, speech-language evaluation of treatment, and physical medicine. The goal of these services is to assist patients in reaching their greatest functional potential.

New clinical services offered during 1987 include evaluation and treatment of the rehabilitation needs of children with AIDS.

Significant progress has been made in several areas during the year. The physical therapy section has completed a three-year study on 20 oncologic amputees to assess their functional level prior to and following surgery. A videotape entitled "Rehabilitation of the Oncology Patient" has been completed and made available as a training tool.

The occupational therapy section has developed a questionnaire for patients and family members caring for persons with Alzheimer's disease. It is designed to evaluate patients' independence in self-care and daily living skills and is used to identify, in an objective manner, activities in which patients can function.

The speech and language pathology section has continued to focus its research activities on aspects of oral-motor function during speech and swallowing. Considerable progress has been made in understanding normal tongue activity during speech. Central tongue grooving has been studied from the coronal view by using real-time ultrasound imaging. Coronal imaging provides previously unattainable information on the shape and deformation of the tongue and oral soft tissues during vowel production. These findings may serve to modify the standard models of lingual positioning during vowel formation.

The medical section studied the effects of surgery designed to preserve limb and limb function by measuring gait, stride, and functional outcomes in patients with extremity cancers. The section also is evaluating the influence of long leg bracing on gait and stride parameters in children with osteogenesis imperfecta.

The combined efforts of the medical, speech, occupational, and physical therapy sections have been applied to further understand the impact of polymyositis and dermatomyositis on strength; ultrasound assessment of oral dysphagia and quantification of activities of daily living have been developed for these patients.

FY '87 brought dramatic changes to the biomechanics laboratory. Following an evaluation of the instrumentation and procedures utilized in the laboratory, a new system for data acquisition and reduction was put into use. This new system dramatically decreased the time required for data capture and reduction to the extent that clinical procedures can be biomechanically evaluated and altered during a single test. The improved accuracy and precision of the system has afforded researchers and clinicians the opportunity to evaluate the most subtle components of human movement.

The workload for the Clinical Pathology Department and its five services was comparable to that of FY '86 and included the performance of 3.2 million laboratory tests. Universal precautions were implemented for handling all blood and body fluid specimens, which increased the required time per specimen.

Chemistry

The major efforts of the clinical chemistry service were directed at enhancing the quality and breadth of services offered. The groundwork was laid for a major expansion in the number of tests to be offered in FY '88, both in-house and through outside contractors. During FY '87, valproic acid and a new, highly sensitive urine human chorionic gonadotropin assay were added to the service. The laboratory robotics system was successfully adapted to measure urinary 17-hydroxycorticosteroids and showed a good correlation with the existing manual method. A new, more convenient system for providing essential STAT services will be implemented in routine operations very early in FY '88.

A large number of research and development projects were successfully continued during the year. A novel method for measuring the antibiotic, 5'-fluorocytosine, was developed and a patent application filed. This assay will be placed in routine use early in FY '88. Lactate dehydrogenase isoenzymes and phosphohexose isomerase were studied as serum tumor markers. Several free thyroxine (FT_4) assays and a battery of other thyroid function tests were evaluated in sick patients with non-thyroidal illnesses associated with abnormal T_4 binding proteins. Major problems with methods using certain analytical principles were identified. In an important collaborative effort with NCI, a role for endotoxin in producing the toxic effects of IL-2 therapy was ruled out. Electrophoretic analysis of serum immunoglobulins in HIV carriers and patients with angioedema continued. The accuracy of various cholesterol methodologies was extensively evaluated in order to ensure that results provided by the service are consistent with new guidelines for identifying and treating hypercholesteremia.

Hematology

The hematology service has continued to provide clinical consultation and to direct the operations of the clinical hematology laboratory. The hematology service identified a heparin-like anticoagulant in the blood of several NCI patients receiving the drug suramin. The anticoagulant caused significant morbidity and mortality. Effective therapy involved plasma exchange transfusion. The anticoagulant may play a significant role in the antitumor effect of suramin. The cause of anemia associated with AZT therapy was identified.

Nine monoclonal antibodies have been successfully employed in the flow cytometric analysis of platelets to identify patients with more than 2 to 3 percent activated platelets in their blood. This technique may allow for the rapid diagnosis of patients with a "prethrombotic" state. Studies of patients with chronic renal failure have identified abnormalities of the plasma and platelet von Willebrand factor, which explains in part the prolonged bleeding time and the hemorrhagic diathesis these patients manifest.

Immunology

The immunology service provides support for an active program of development and collaborative research in the investigation of the immune system. The most recent examples of this have been the development and introduction of a test for determining anti-cardiolipin antibodies and the determination of anti-Jo 1 antibody as part of an extractable nuclear antibody (ENA) screen.

Flow cytometry for the evaluation of lymphocyte subsets continues to be an area of great interest and collaborative research. A number of patient groups have been evaluated with extensive two-color monoclonal antibody panels resulting in a variety of novel findings. The service makes a concerted effort to teach clinicians and other laboratory workers about new developments in diagnostic laboratory immunology.

Microbiology

The microbiology service performed 43,000 tests in FY '87 and continues to upgrade existing procedures and introduce new methods. *Mycobacterium tuberculosis* and *Mycobacterium avium-intracellulare* complex can now be identified from culture isolates in two hours by a DNA probe technique, in contrast to several weeks by conventional methods. Pneumocystis infection can be accurately diagnosed by a monoclonal antibody technique applied to induced sputum, thus avoiding an invasive diagnostic procedure.

Investigations in progress include the use of chromatographic technique to aid in the identification of mycobacterium in general, an enzyme immunoassay for the identification of herpes simplex from clinical specimens, the methodology for performing inhibitory and bactericidal titrations of patient sera to help assess the adequacy of antibiotic therapy, and an improved blood culture method.

Phlebotomy

The phlebotomy service experienced an increase in workload. Outpatient phlebotomy visits increased more than 15 percent during the year. Also, the implementation of universal precautions required more time per phlebotomy event. Several institutes requested weekend and holiday phlebotomy service for inpatients.

TRANSFUSION MEDICINE

This year marks the 50th anniversary of the first American blood bank, founded in 1937 by Bernard Fantus at the Cook County Hospital, Chicago. Fantus' concept of banking blood revolutionized the practice of medicine. Yet the specialty of transfusion medicine has changed dramatically since the days when the major service and research problems revolved around the availability of whole blood and the ability to store it for future use. Nowhere is the breadth of new activities in this specialty better exemplified than in the programs of the Department of Transfusion Medicine (DTM).

Blood Services

The pattern of blood usage at the Clinical Center changed remarkably during FY '87. There was a 9 percent decrease in the number of red cell units transfused compared to a year earlier and only a 3 percent increase in platelet usage, both coming in the face of a 20 percent decline during the previous year. On the other hand, the use of autologous blood, the patient's own blood drawn and processed in advance, increased 13-fold during 1987. Similar trends have been noted nationally. Provision of biologics for research continued the increase that has been noted virtually every quarter since this statistic was first recorded. Although the number of research collections (7,489) increased a modest 1 percent, staff innovations resulted in an additional 844 research components from these collections. Because the nature and often the quality of research blood components cannot be supplied from other sources, this continues to be an important DTM service.

Infectious Disease Prevention

The immunology section's service and research functions involve prevention of transfusion-transmitted disease. With national concerns about AIDS, testing for anti-HIV increased some 54 percent in FY '87 while testing for hepatitis B markers increased 15 percent. Recipients who received potentially infected components between 1977 and 1985 have been traced, notified, and counseled. This labor intensive process confirmed the very high risk of infection to recipients of any component from a unit of infected blood. The department entered the third year of a prospective study of donors who test positive for the virus causing AIDS. Among the interim results is evidence that laboratory markers can predict which asymptomatic donors will develop the disease, that fewer infected donors now belong to the conventional high-risk groups, and that supposed "false positive" donors do not in fact show any evidence of infection with HIV. The latter observation influenced the Food and Drug Administration to permit such donors, previously excluded, to return to volunteer blood donation. For his career achievements related to preventing transfusion-transmitted infections, Dr. Harvey J. Alter was awarded the prestigious Emily Cooley Award by the American Association of Blood Banks.

Apheresis

Specific blood components such as plasma, platelets, and leukocytes can be obtained efficiently using automated cell separation or "apheresis" techniques. Nearly all of the platelets transfused at the Clinical Center are collected by apheresis. Serial plasmapheresis permitted long-term support of an infant with a congenital bleeding disorder by transfusion preparations of clotting factor concentrate prepared from a single donor. More than 3,700 research components were prepared by apheresis procedures. Therapeutic apheresis involves the removal of one blood component, such as plasma, to treat patients, while the remaining components, such as red cells, white cells, and platelets, are returned to the patient. Nearly 100 therapeutic procedures were performed for accepted clinical indications, such as red cell exchange in sickle cell disease, plasma exchange for post-transfusion purpura, and leukocyte reduction in acute leukemia. More than 900 procedures were performed for therapeutic clinical trials such as treating patients with polymyositis or for boosting the immunity of AIDS patients with lymphocytes from an identical twin, a 2 percent increase over 1986.

General

DTM has been a training ground for many prominent blood banking professionals. Today, the staff fellowship program enters one physician each year into a two-year program of service and research. A specialist in blood banking (SBB) program was established for medical technologists in 1966 and currently enrolls three students in a one-year program. All three stu-

dents from the last class won competitive scholarships awarded by the American Association of Blood Banks based on research projects completed during the year. This was the first time any program had won three awards. In addition to weekly seminars for the department staff, department personnel conduct extensive in-service education in transfusion practice for Clinical Center physicians and nurses. In 1987 the department's annual postgraduate seminar concentrated on such recent advances in transfusion medicine as the discovery of new retroviruses in blood transfusion and the inactivation of viruses in blood products.

Ground was broken for a new addition that will house the DTM on the first floor. The circular building, synonymous with the old "Blood Bank," has been abandoned for renovation as a small animal facility. The new addition will house new facilities foreign to the classical blood bank, such as a hemapheresis area for component collection, patient care procedures with automated cell separators, a radiolabeling laboratory for following cell recovery, survival and trafficking, and a cell processing area for preparing such components as cultured, activated lymphocytes for cancer therapy, bone marrow for transplantation, or gene insertion.

Fantus would no doubt approve.

DIAGNOSTIC RADIOLOGY

This year the Diagnostic Radiology Department began to reap the benefits of a major commitment to magnetic resonance imaging. With the opening of the In Vivo NMR Research Center, the capacity to initiate and support clinical and laboratory investigations in magnetic resonance imaging was vastly improved. Two 0.5 Tesla units in the department and a 1.5 Tesla whole body imager in the NMR Research Center are operating. Magnetic resonance imaging has taken its place along with computer tomography and ultrasound as a clinically useful and extraordinarily promising new technique. The clinical efficacy of magnetic resonance imaging, has been established.

Scanning in clinical magnetic resonance imaging has been extended from 7:30 a.m. to 7 p.m. to meet the demand. Major areas of clinical research are the use of magnetic resonance imaging to distinguish adrenal masses, the study of iron content in the basal ganglia of patients with movement disorders, and the detection of ACTH-secreting pituitary microadenomas in patients with Cushing's disease. The principal areas of research interest concern the development of new paramagnetic contrast agents, evaluation of the blood-brain and blood-retinal barriers, and abnormalities of phosphorus spectra in tumors undergoing chemo- or radiation therapy.

In addition to the development of magnetic resonance imaging, the Diagnostic Radiology Department continues to provide radiological services for patients on an ever-expanding scale. Although the total number of examinations remain essentially the same (78,400 in 1986 compared to 77,787 in 1987) the number of complicated examinations, particularly magnetic research images, has increased significantly. Routine fluoroscopic studies, especially involving the GI tract, are decreasing. Special procedures increased by approximately 50 examinations this year. The major problem, however, is meeting the demands for cross-sectional imaging studies, particularly ultrasound, computer tomography, and magnetic resonance, which have become integral parts of evaluation and follow-up of patients with tumors.

This has been a year of growth, refinement and challenge for the Nuclear Medicine Department (NMD). The department has provided nuclear medicine services to Clinical Center patients and supported the various institutes through clinical diagnostic imaging and research collaboration.

In the midst of a technologist shortage due to recruitment difficulties, the clinical diagnostic section continues on a steady path providing essential diagnostic imaging services. The number of studies performed in the department has increased by 29 percent from FY '86. A new clinical service, single- and dual-photon bone absorptiometry, is now being provided. Absorptiometry is a low-cost, highly sensitive method for measuring bone density using a low radiation dose. Various endocrine disorders, renal diseases, and many medications lower bone density. The bone absorptiometry measurements assist in diagnosis and treatment of these diseases. In addition to supplying routine diagnostic studies, this new service supports five major protocols of various institutes. The clinical diagnostic imaging section also supports specialty imaging and nuclear medicine services in support of such specific research protocols as 111-In oxine labeled lymphocyte kinetic studies in polymyositis patients; T.I.L. cell kinetics in cancer patients; DTPA aerosol in Alpha-1 Antitrypsin deficiency patients; Single Photon Emission Tomography (SPECT) imaging of 99m-Tc-MAA distribution from intra-arterial hepatic catheters in chemotherapy patients; and renal blood flow quantitation in patients receiving cyclosporine therapy.

The department continues to refine and expand two major research efforts including:

Positron Emission Tomography (PET)

This is a collaborative effort among seven institutes, the PET imaging section, the cyclotron facility, and the radiochemistry and pharmacy sections of the department. The continued synthesis of positron-emitting radiopharmaceuticals and the development of new production methods have allowed additional PET imaging such as measurement of cerebral perfusion with 0-15 labeled water in normal volunteers and measurement of myocardial perfusion with N-13 ammonia in animals. Work continues on protocols involving Alzheimer's disease, brain tumor regrowth, and complications following treatment with radiation therapy or chemotherapy. The cyclotron facility collaborated with the Bethesda Naval Hospital in a study of hyperbaric effects on humans using Nitrogen-13 labeled nitrogen gas. The imaging physics section developed an automated blood radioactivity analyzer for short-lived PET radiopharmaceuticals. The section has contributed to the continued growth of the PET effort through outstanding technical support of the three PET scanners, developmental work on a thermoplastic head restraint system, and spatial tracking device for PET patient repositioning.

Radiolabeled Monoclonal Antibodies (MOABS)

Research continues in the diagnostic and therapeutic applications of this exciting imaging technique. Radiolabeled Moabs are used to detect malignant disease and the extent of metastases by imaging with a gamma camera. The focus continues to be on the clinical diagnostic and therapeutic use of Moabs including the treatment of intraperitoneal metastases from colorectal and ovarian adenocarcinomas with I-131 radiolabeled monoclonal antibody, treatment of chronic leukemias with Yitrium-90 radiolabeled monoclonal antibody, and imaging of adult T-cell leukemia/lymphoma with radiolabeled Anti-TAC monoclonal antibody. Several collaborative efforts are ongoing with the National Cancer Institute and private industry including the study of kinetic patterns of radiolabeled autologous monocytes in normal volunteers, development of radiolabeled monoclonal antibody dosimetry algorithms, and computer programs to allow for quantitative imaging using SPECT.

NURSING SERVICES

The Nursing Department provides care to patients and normal volunteers participating in clinical research studies and collaborates with investigators in study coordination, data collection, patient monitoring and documentation of observations. The department was reorganized under a new associate director for nursing; the nursing staff undertook several administrative projects; and began to capitalize on the unique advantages of the Clinical Center to recruit and retain nurses. In FY '87, the vacancy rate was cut by 65 percent, service chiefs for the cancer, arthritis, allergy, and child health units were incorporated into the nursing executive group, and two new divisions were created to support marketing, information systems, and quality assurance. A record number of new employees was hired.

The Nursing Board was instituted to provide a forum for communication. The department has four role groups, three standing committees, and several task forces that report to the board, as do the 52 nursing representatives on Clinical Center, NIH, and PHS committees. As issues are raised by members of the department, they are brought before the board for recommendation, approval or referral. The board approved a revision of the department, an organizational chart, goals for 1987, and a philosophy statement.

Recruitment and retention of nurses was a major focus for the year, both to staff existing programs and start new research. An important part of the recruitment program has been to address salary and scheduling issues that severely hampered the Clinical Center's ability to compete with other hospitals. A proposal was developed for new pay authorities under Title 38 that provides flexibility similar to the VA system. The new salary scales have had an important impact on the ability to recruit recent graduates and experienced nurses.

The department responded to revised JCAH requirements for quality assurance. Unique clinical indicators for specific patient populations have been developed, based on a prototype system created by critical care and heart-lung nursing services. Ongoing "grass roots" monitoring of patient outcomes has been implemented on all inpatient and five outpatient areas.

In addition to organizational and administrative changes, the clinical role of nurses has changed. Primary nursing, always an important part of nursing practice at the Clinical Center, has been updated to reflect changes in the nursing profession. Because so many patients move through several different settings, the focus is on case management and continuity of care throughout a research study. Several of the services have examined primary nursing as it applies to their unique patient populations. For example, the cancer nursing service has reviewed primary nursing in the care of oncology patients and has established unit level committees to oversee the development of standards and evaluate ongoing practice.

During 1987, 234 new staff members, including nurses on contract, completed orientation. The preceptorship program was revised to assure that new staff receive consistent support and training on the units after general orientation is completed. A special program has been designed to support the transition from student to practicing nurse for the large number of new graduates now being hired. This five-week graduate seminar program begins after the new nurse has had eight weeks of clinical orientation and includes five weeks of seminars and follow-up sessions. Twenty-five new graduate nurses entered the program. Specialty training programs have been successful including the cancer training program, an expanded critical care orientation program, and a critical care internship program.

The department also continued to host professional nursing conferences. The FY '87 agenda included the Distinguished Nurse Lecture, the First Annual Oncology Nursing Conference, and the 13th Annual Nursing Research Symposium. For the first time, nurses were presenters at Clinical Center Grand Rounds.

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Clinical Center Communications

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